

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
RENTON, WASHINGTON 98057-3356

In the matter of the petition of

The Boeing Company

for exemption from § 25.809(a) of Title 14, Code of
Federal Regulations

Regulatory Docket No. FAA-2011-0883

GRANT OF EXEMPTION

By letter RA-11-03878, dated July 25, 2011, Ms. C. M. Thompson, Lead Project Administrator, Development Projects, The Boeing Company, P.O. Box 3707, Seattle, Washington 98124-2207, petitioned for exemption from Title 14, Code of Federal Regulations (14 CFR) 25.809(a), as amended by Amendment 25-116. The proposed exemption, if granted, would permit relief for a limited number of Boeing Model 747-8 series airplanes from the requirement that passenger emergency exits have a means to view outside conditions under all lighting situations. This petition applies to the upper-deck passenger exits, and the main-deck exits located at doors 1, 2, 4, and 5. This petition does not include the passenger exits at door 3.

The petitioner requests relief from the following regulations:

Section 25.809(a), at Amendment 25-116 – requires that each emergency exit be provided with a means to view conditions outside the airplane prior to opening an exit, under all lighting conditions.

The petitioner supports its request with the following information:

This section quotes the relevant information from the petitioner's request. The complete petition is available at the Department of Transportation's Federal Docket Management System, on the Internet at <http://www.regulations.gov>, in Docket No. FAA-2011-0883.

Section of the Code of Federal Regulations (CFRs) that are Affected

As provided for in § 11.61(b), Boeing hereby petitions for a Serialized Exemption to the following CFR for the model 747-8:

Regulation	Amendment	Which Requires
§ 25.809(a)	116	...each emergency exit must have means to permit viewing of the conditions outside the exit when the exit is closed. The viewing means may be on or adjacent to the exit provided no obstructions exist between the exit and the viewing means. Means must also be provided to permit viewing of the likely areas of evacuee ground contact. The likely areas of evacuee ground contact must be viewable during all lighting conditions with the landing gear extended as well as in all conditions of landing gear collapse.

The Extent of Relief Being Sought

No relief is sought for the flight deck over head exit or for the overwing exit (door 3) because the certification basis for the 747-8 does not include § 25.809(a) at Amendment 116 for these exits. All other exits require relief as noted below.

Regulation	Requires	Why relief is necessary
§ 25.809(a) at Amendment 116	The likely areas of evacuee ground contact must be viewable during all lighting conditions prior to door opening.	<p>Relief is necessary because there is not an exterior lighting system at the majority of the exits that illuminates prior to the exit being opened. The majority of the design of the existing 747-8 emergency lighting system is carried over from the classic 747s. Furthermore, the FAA and Boeing have not agreed to guidance regarding an acceptable method of showing a new exterior lighting system compliant to § 25.809(a) at Amendment 116. Therefore, it would create a significant burden if Boeing were required to incorporate a new exterior lighting system on the early production 747-8 airplanes.</p> <p>Description of relief sought: With this petition for exemption, Boeing is requesting relief from the requirement that the likely areas of evacuee ground contact must be viewable during all lighting conditions prior to the passenger emergency exits being opened for a limited number of 747-8 airplanes. This will allow sufficient time to develop, certify and incorporate into production a new exterior lighting system that will enable all subsequently manufactured 747-8 airplanes to fully comply with § 25.809(a) at Amendment 116 for those doors with Amendment 25-116 in the 747-8 Certification Basis. Boeing will have the new exterior lighting system incorporated into the 747-8 production line prior to August 1, 2014.</p>

Description of the Issue

The Boeing 747-8 is a derivative of the 747-400 passenger airplane with six pair of Type A exits. These exits have the outside viewing, via windows, and an exterior emergency

lighting system designed for compliance to § 25.812 Amendment 28 carried over from the 747 classics. This design includes door mounted lights at each main deck and upper deck exit, which are mounted on the inside of the door and provide the exterior emergency lighting once the exit is opened. In addition, the over wing exit, door 3, includes exterior fuselage mounted lights used to illuminate the ramp, sliding surface, and ground contact area for compliance to § 25.812 Amendment 28. Doors 1 and the upper deck, due to new escape slide designs, are designed to meet § 25.812 at Amendment 120 and include emergency lighting on the escape slide as well as the original lighting on the interior of the airplane. The emergency lighting system as designed for compliance to § 25.812 is activated as follows:

- Automatically activated upon loss of main electrical power (28 VDC bus) when the system is armed.
- Manually activated via the emergency light switches either in the flight deck or cabin attendant area.
- The escape slide mounted lights, doors 1 and upper deck, are activated upon the deployment of the slide.

Because the majority of these lights are mounted on the interior of the airplane or door frames they do not meet § 25.809(a) Amendment 116. Therefore additional exterior lights for all doors, except door 3, will be required for compliance to the new rule.

The model 747-8 certification basis was initially established based on § 21.101 changed product rule with the understanding that a full exception from § 25.809(a) at Amendment 116 back to Amendment 114 would be granted. Subsequently, the decision was made to include § 25.809(a) at Amendment 116 for the passenger emergency exits in the certification basis of the 747-8.

Production of the initial 747-8 airplanes started prior to the decision to include § 25.809(a) at Amendment 116 in the certification basis of the 747-8. Based on the late decision to include § 25.809(a) in the certification basis of the 747-8 and the associated methods of compliance that are not yet finalized the FAA acknowledged that there may be merit to an exemption that covers a limited number of 747-8 airplanes. As a result, Boeing is requesting relief from the “all lighting conditions” element of § 25.809(a) for a limited number of 747-8 airplanes. If granted, this exemption will allow sufficient time for Boeing to develop, certify and incorporate into production a new exterior lighting system that is compliant with § 25.809(a) at Amendment 116.

Upon release of the FAA method of compliance for the Model 747-8 exterior viewing system, Boeing will release a specification control document for the new lighting system and will be working through the supplier selection process. Once selected, the supplier will assist Boeing with the development, qualification and certification of the new fuselage-mounted exterior viewing lighting system. Development and incorporation of a new emergency lighting system, which will take several years, normally occurs during the development phase of a new airplane program. As noted, it was expected that this

regulation would be removed from the certification basis, so corresponding development was not addressed early on in the program. The 747-8 program will experience added complexities and schedule challenges as integration of the new lighting system must be incurred during the production ramp-up stage of the program. The new lighting system must be compatible with and integrated into the existing 747-8 emergency lighting design that is a hybrid due to the derivative nature of the airplane.

As previously noted in the 787 Denial of Exemption number 9957, the FAA recognizes that a retrofit of an existing design to comply with the outside viewing requirements of § 25.809(a) could be costly. This was acknowledged when Amendment 25-116 was initially proposed and adopted and considered in the decision for no retrofit requirements for in-service aircraft. In addition, implementation of provisions for the exterior lighting system and associated penetrations must be incorporated into the build process in sequence for maximum efficiency. A number of 747-8 airplanes are complete and production will continue prior to the availability of the lighting system provisions and penetration definitions. As such, Boeing requests that there be no retrofit requirement for the 747-8 airplanes that are delivered without the new exterior viewing lighting system.

Statement of No Adverse Effect on Safety

The FAA's stated intent with the new outside viewing requirements introduced at Amendment 25-116 was not to address a known safety issue, but rather to upgrade the regulations to improve the overall level of safety in areas where the state-of-the art and good design practice have indicated that such upgrades are warranted.

The 747-8 carried over, from the 747 classics, the design of the full size passenger windows on all main deck doors and the upper deck adjacent full size passenger windows. The 747-8 also carried over, from the 747 classics, the exterior lighting system that is mounted on the interior of the doors. Additionally the new escape slides at doors 1 and the upper deck include an escape slide-mounted exterior emergency lighting system that is similar to the exterior lighting systems commonly used in many transport category aircraft type certified prior to the 747-8. The full size windows provide for a wide, undistorted viewing area and are an effective means for quickly assessing conditions outside the emergency exit prior to the emergency exit being opened. The 747-8 full size windows are larger and better than view ports used on many exits in service today. Full size windows make it easier to recognize the presence of an external fire or other hazard that should be considered when determining whether or not to open the exit during an emergency. Therefore, the proposed limited number of 747-8 airplanes that will be operated without the new fuselage-mounted exterior emergency lighting system will provide a level of safety that is superior to that provided on many of the transport category aircraft currently in production.

Public Interest

Granting this petition is in the public's interest because it would allow adequate time for Boeing and its suppliers to develop an effective design solution to the exterior lighting system requirement that was agreed to be included in the certification basis of the Model

747-8 after the airplane development program completed firm configuration. Conversely, if the requested relief is not granted, the addition of a new fuselage-mounted lighting system at this late stage of the airplane development program would lead to a significant delay to the deliveries of the 747-8 airplanes. The public interest will be advanced by the grant of Exemption as it is in the best economic interest of the United States. At this time, all known 747-8 customers are overseas. Further delivery delays of the 747-8 are not in the interest of the public due to the potential negative impact to the export sales, the balance-of-trade, the gross domestic product and the economic health of the United States.

Further, Grant of Exemption as requested in this petition is in the best interest of the travelling public through introduction of this new product into the marketplace that has advanced the certification basis of the majority of the cabin safety regulations as compared to the 747-400. It is the petitioner's opinion that the overall level of safety is improved due to the certification basis advancement, by comparison to the previous 747-400's that are certified with similar configurations and evacuation systems, which is in the public's best interest.

Request for Waiver of Publication

The petitioner requests that this Petition for Exemption not be delayed by the public process, which includes publication of the subject petition, due to the fact that this Exemption will not set a precedent. The 787-8 was granted a similar serialized Exemption under Exemption no. 10235. Boeing believes good cause exists to waive the publication and comment requirements of §§ 11.85, 11.87, and 11.89.

Due to the scheduled delivery of the first 747-8 being in late 2011, a delay in processing this exemption could potentially result in delays in the delivery schedule. The similar 787 exemption received one public comment, but that was with regard to the electronically dimmable window used on the 787. Since no comments were received related to the "all lighting conditions" for the 787 exemptions, it is anticipated that no comments would be received for this petition of similar nature.

Privileges of this Exemption Outside the United States

Per § 11.81(h), Boeing requests that the privileges of this Exemption be extended outside of the United States. This extension of privileges is necessary for operations based within foreign countries having bilateral agreements with the United States accepting FAA 14 CFR Part 25 as their airworthiness standards for transport category aircraft. The 747-8 is intended for the global market place.

Conclusion

All model 747-8 passenger doors have outside viewing means on or adjacent to the exit that are sized and positioned to allow for a quick assessment of external conditions. Except for over wing exit, door 3, this includes the area where the evacuees would normally be expected to make contact with the ground when the airplane is positioned at

a normal attitude or at the adverse attitudes that correspond to the loss of one or more legs of landing gear. The full size windows, compared to the majority of the emergency exit windows in service today, allow for ground viewing without the need for a prism or any other viewing aids that can distort the view out of the window. As discussed above, passenger and crew safety will not be appreciably affected by a grant of exemption in this case.

Since Amendment 25-116 was only recently agreed to be included in the certification basis of the 747-8, after the 747-8 emergency lighting system design was established, additional time is needed to develop a new exterior lighting system that will allow the 747-8 passenger exits to comply with the outside viewing requirements in § 25.809(a) at Amendment 116 for the established certification basis of the 747-8. Accordingly, Boeing respectfully requests that an exemption is granted to allow relief from the “all lighting conditions” requirement of § 25.809(a) at Amendment 116 for passenger exits on the 747-8 airplanes delivered on or before August 1, 2014 with no retrofit requirement.

Federal Register publication

A summary of the petition was published on August 31, 2011 (76 FR 54287). No comments were received.

The FAA's analysis

The FAA has reviewed Boeing's petition for exemption and has concluded that granting this exemption is in the public interest for the reasons Boeing presents above.

The FAA's agreement with the petition takes into consideration the complexities of modifying fuselage structure and the fact that the system being designed and installed is unique and does not serve other certification functions.

Because the cost of a retrofit to meet this requirement is high, the FAA sees merit in a time-limited exemption that addresses only those airplanes for which manufacturing has proceeded to the point where compliance requires a retrofit.

The FAA's decision

In consideration of the foregoing, I find that a grant of exemption is in the public interest. Therefore, pursuant to the authority contained in 49 U.S.C. §§ 40113 and 44701, delegated to me by the Administrator, The Boeing Company is hereby granted an exemption from 14 CFR 25.809(a), to permit relief from the requirements that passenger emergency exits have a means to view outside conditions under all lighting situations for the Boeing Model 747-8 series airplanes for upper-deck passenger exits, and the main-deck exits located at doors 1, 2, 4, and 5, subject to the following limitations.

1. For each airplane covered by this exemption, outside viewing means at each passenger emergency exit must meet all of the requirements of § 25.809(a) in daylight conditions.
2. This exemption does not apply to any airplanes delivered after August 1, 2014.

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